THE Southport Society of Natural Science has issued its first report, from which we learn that the Society, although still very young, is doing good work as a local centre of scientific inquiry. The report includes a presidential address by Dr. H. H. Vernon, on the material and educational utility of natural science.

MR. EDWARD STANFORD has issued "The Hand-book of Jamaica for 1892." This is the twelfth year of publication. The work has been compiled from official and other trustworthy sources by S. P. Musson and T. Laurence Roxburgh. It comprises all necessary historical, statistical, and general information relating to the island.

THE latest instalment of the Transactions of the Royal Society of Victoria (vol. ii. part 2) opens with a paper on the occurrence of the genus Belonostomus in the rolling downs formation (Cretaceous) of Central Queensland, by R. Etheridge, Jun., and A. S. Woodward. There are also papers on the structure of *Ceratella fusca* (Gray), by Prof. W. Baldwin Spencer; additional observations on the Victorian land planarians, by Dr. A. Dendy; and land planarians from Lord Howe Island, by Prof. W. Balwin Spencer. Each of the papers is illustrated.

PROF. S. H. GAGE, of the Cornell University, has reprinted an interesting paper contributed by him to the *American Naturalist* on the life-history of the vermilion-spotted newt (*Diemyctylus viridescens*, Raf.). He has added to it a valuable annotated bibliography.

A REPORT on the geology and mineral resources of the central mineral region of Texas, by T. B. Comstock, was included in the second Annual Report of the Geological Survey of that State, and has now been issued separately. It ought to be of good service to practical men as well as to students of science. The author has a valuable note in which he shows how the prospector, the capitalist, or the property-holder may most advantageously use the report.

AN excellent essay on aboriginal skin-dressing, by Otis T. Mason, has been reprinted from the Report of the U.S. National Museum for 1888–89. It is based on material collected in the Museum, and includes an account of skin-dressing among the Eskimo and the Indians. There are many illustrations.

THE following science lectures will be given at the Royal Victoria Hall during May:—May 3, "Flying Bullets," by C. Vernon Boys; May 10, "Travels in Java and Sumatra," by Wm. Hancock; May 17, "The Wonders of the Rocky Mountains," by Wm. Carruthers; May 24, "Mines and Mining," by Bennett H. Brough; May 31, "The Alps in Winter," by C. T. Dent.

THE results of an investigation, concerning the conditions of silent combination of the hydrogen and oxygen contained in the detonating mixture of these gases obtained by the electrolysis of water, are communicated to the current number of *Liebig's Annalen* by Prof. Victor Meyer and Herr Askenasy. The object of the experiments was to ascertain whether any regular connection existed between the duration of time, during which such a mixture of the two gases is maintained at a temperature at which silent combination slowly proceeds, and the amount of water produced. The main result of the experiments has been to afford a direct negative to this question, the amount of combination under precisely the same conditions of temperature, pressure, and time varying most irregularly. Although this is the case, however, some interesting phenomena have been observed during the course of the experiments. It was found that, when a quantity of the pure dry mixture of two volumes of hydrogen and one volume of oxygen was sealed up in a glass bulb and heated in a bath of the vapour of phosphorus pentasulphide, the temperature of which (518°) is such that the bulb becomes faintly luminous, no explosion occurred, but a small proportion of the gases silently combined, with production of water. Upon immersing the bulb, however, in a bath of boiling stannous chloride (606°), explosive combination instantly occurred. It was surmised, therefore, that the temperature at which explosion occurs lies somewhere between 518° and 606°. But upon modifying the experiment in such a manner that the bulb was open, a slow stream of the gaseous mixture being allowed to pass continuously through, it was found that no explosion ensued under these conditions at the temperature of boiling stannous chloride, although at this temperature the bulb glows with a cherry red heat, and the glass is quite soft. It appears likely, therefore, that the extra pressure of the gases in the closed vessel determines the explosion at a lower temperature. The irregularity in the rate of silent combination would appear to be due to the different condition of the inner surfaces of the vessels containing the gaseous mixture; probably largely owing to the different amount of etching action by the water vapour at these high temperatures. In order to eliminate this disturbing element, the experiments have been repeated with bulbs whose inner surfaces have been equally etched beforehand and with bulbs whose interior walls have been silvered, the results, however, showing in both cases the same irregularity. In connection, however, with the experiments with silvered bulbs, another striking fact has been brought to light. It was found that in these bulbs the silent formation of water occurs at temperatures several hundred degrees lower than in unsilvered glass bulbs. Complete combination had occurred in two hours' time at the temperatures of boiling phosphorus pentasulphide (518°), sulphur (448°), diphenylamine (310°), and naphthalene (218°); 70 per cent. of the mixed gases had combined at the temperature of boiling aniline (183°), and a small amount of combination had occurred even at 155°. Finally, it was found that bright July sunshine is incapable of inducing the combination of hydrogen and oxygen, even when it is concentrated upon a bulb traversed by the gaseous mixture and heated to 606° in a bath of boiling stannous chloride.

THE additions to the Zoological Society's Gardens during the past week include a Patas Monkey (*Cercopithecus patas*) from West Africa, presented by Mr. W. S. Hewby; two Orinoco Geese (*Chenalopex jubata*) from South America, presented by Mr. Everard F. im Thurn, C.M.Z.S.; two Mute Swans (*Cygnus olor*), European, presented by Mrs. Melville; a Herring Gull (*Larus argentatus*), British, presented by Miss Lota Bower; two Chinese White-eyes (*Zosterops simplex*) from China; an Egyptian Goose (*Chenalopex ægyptiaca*) from Africa, deposited; a Cheer Pheasant (*Phasianus wallichii* ♂) from Northern India, a Swinhoe's Pheasant (*Euplocamus swinhoii* ♀) from Formosa, a Common Pheasant (*Phasianus colchicus* ♀), British, six Wigeon (*Mareca penelope*, females), twelve Common Teal (*Querquedula crecca* 6 ♂ 6 ♀), European, purchased; a Crested Porcupine (*Hystrix cristata*), born in the Gardens.

OUR ASTRONOMICAL COLUMN.

SPECTRUM OF NOVA AURIGÆ.—On February 22, Mr. E. W. Maunder obtained a photograph of the spectrum of Nova Aurigæ with an exposure of seventy minutes. The photographic magnitude of the star was then 4·78, and its visual magnitude was about 5·7. Bright lines were observed upon the plate at the following wave-lengths:—4919, 4860 (F), 4629, 4580, 4547, 4510, 4472, 4340 (G), 4229, 4174, 4101 (*h*), 3968 (H), 3933 (K), 3887·5 (α), 3834 (β). And dark lines had their positions located as follows:—4316 (G), 4212, 4155, 4085 (*h*), 3953 (H), 3913 (K). Measures of the displacement

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of the dark lines relatively to the corresponding bright ones gave a mean of 18·3 tenth-metres. According to this, the relative motion of the two bodies engaged was about 820 miles a second. Mr. Maunder also observed the visual spectrum of the Nova. Three bright lines were seen, and estimated to be in the positions of C, D, and F of the solar spectrum. A line was detected "not far from E," another "near *b*, but further towards the blue," and another "very near the chief nebular line." The line measured on the photograph as at λ 4919 was also made out.

Photographs of the Region of Nova Cygni.—At the March meeting of the Royal Astronomical Society, Mr. Roberts stated the results of a comparison of Drs. Copeland and Lohse's catalogue and chart of the region of Nova Cygni with two photographs of the same part of the heavens taken in September 1891. It appears that the brightness of some of the stars has undergone changes since 1878, when the chart was made. Changes of this character may, of course, be due to the well-known difference between visual and photographic magnitudes; but there are other differences, which are not so easily explained. Several stars, single on the chart, are seen to be double on the photographs, and some changes in relative position seem to have occurred. Although the Nova is not given on the chart, it appears on the photographs as a star of about magnitude 13. It will be interesting to compare Mr. Roberts's pictures with others taken under similar conditions at some future date, in order to determine definitely whether the changes are real, or due to errors in observation or cataloguing.

Winnecke's Comet.—Dr. G. F. Haerdtl gives the following ephemeris in *Astronomische Nachrichten*, No. 3083:—

1892.		R.A.			Decl.			Brightness.
		h.	m.	s.	°	′	″	
April	29	11	36	4·49	+43	55	41·3	
,,	30		34	22·64	44	2	13·6	
May	1		32	42·41		8	8·3	2·38
,,	2		31	3·89		13	25·6	
,,	3		29	27·21		18	6·3	
,,	4		27	52·46		22	11·9	
,,	5		26	19·62		25	43·4	2·71
,,	6		24	48·66		28	42·1	
,,	7		23	10·55		31	8·6	
,,	8		21	52·27		33	3·6	
,,	9		20	26·81		34	28·1	3·10
,,	10		19	3·16		35	23·3	
,,	11		17	41·31		35	50·0	
,,	12		16	21·18		35	49·6	
,,	13		15	2·62		35	22·5	3·58
,,	14		13	45·59		34	29·4	
,,	15		12	29·98		33	11·2	
,,	16		11	15·72		31	28·7	
,,	17		10	2·63		29	22·9	4·17
,,	18		8	50·51		26	55·0	
,,	19		7	39·29		24	5·2	
,,	20		6	28·92		20	53·7	
,,	21		5	10·08		17	21·4	4·91
,,	22		4	9·48		13	29·0	
,,	23		2	59·99		9	17·4	
,,	24		1	50·50		4	47·8	
,,	25	11	0	40·59	44	0	0·3	5·84
,,	26	10	59	29·91	43	54	55·3	
,,	27		58	18·15		49	33·4	
,,	28		57	5·05		43	55·1	
,,	29		55	50·13		38	0·7	7·04
,,	30		54	33·03		31	50·9	
,,	31		53	13·21		25	25·2	

Personal Equations in Transit Observations.—An accurate determination of an observer's personal equation is to-day of as much importance as an observation itself, when such small quantities, as we now deal with, have to be measured. The variation in the latitude, of which we have heard so much of late, amounts to a quantity only a few times larger than that of a moderate personal equation, showing that no small regard must be paid to its estimation. In observing an N.P.D., the star has to be bisected by the horizontal wire, while the nadir point has also to be observed: in both these cases an error can arise from personality, for the best observers cannot make a really true bisection. In the taking of transits another personality exists, but this is rather of a different kind, for, using the eye and ear method, the clock beats have to be taken into account simultaneously with the relative positions of the star and certain wires. In the April number of the *Bulletin Astronomique*, an account is given of some experimental researches on such transit determinations in which both methods, the eye and ear and the chronograph, were used. The observations were made with an apparatus similar to that designed by Wolf, who, to obtain artificial transits, employed a small truck to carry the plates, on which punctures of different sizes were made. From 115 observations made with both methods, it was found that equally accurate results were obtained, the eye and ear method, if any, proving a little inferior, while the degree of lighting of the field made no appreciable variation on the personal equation. For planets the electrical method showed that personality varied considerably, according to whether the preceding or following side was observed: the resulting personal equation for the centre of a planet turned out to be −0·046s., while that for a star under the same conditions was +0·023s. It would be interesting to find out whether this occurs when the eye and ear method is employed. The tendency of an observer, adopting the eye and ear method, to choose certain tenths of a second in preference to others, seems to have its analogy in the chronograph method, in the linear measurement from the second impressions. A comparison given here shows that the most favourable tenth is the *zero*, while the *nine* is very considerably left out in the cold. Another very curious fact is that the tenths, one, two, three, four, chosen in the chronograph methods, are all *less* than the corresponding ones in the other methods, while the opposite occurs for the tenths five to nine.

Tenths	0	1	2	3	4	5	6	7	8	9	Total
Eye and Ear . .	157	97	134	134	100	94	82	81	74	57	1000
Chronograph . .	164	79	96	90	94	129	104	94	81	69	1000

The Sirius System.—Dr. A. Auwers contributes to the *Astronomische Nachrichten*, Nos. 3084 and 3085, a long discussion with reference to our "Knowledge of the Sirius System." The problem which he undertook was to investigate whether the measures of the companion obtained during the period extending from 1862 to 1890 would satisfy an ellipse with a 49·4 year revolution; to determine the most probable value of the place elements for every measurement on the assumption of the revolution; and to inquire whether the observations of the principal star could be represented by means of the so determined elements. The author divides the discussion into the following three parts:—(1) A summation and sifting of all the measures that have been made of this companion for the above-mentioned period. (2) The derivation of the normal places, and the correction of the elements. (3) A comparison of the meridian observations of Sirius with the elements derived from the measurements of the companion. The result of the discussion is that a slight correction is necessary to reduce the right ascension and declination of the bright star to the centre of gravity of the two bodies (the masses of the chief star and of the companion being taken as 2·20⊙ and 1·04⊙). The table showing these corrections indicates that the right ascension between the years 1850 and 1890 has to be increased by a quantity which reaches to 0·232s., while between 1890 and 1896 5 a diminution takes place. The greatest correction for the declination is + 2″·268, which occurs in 1882·0, and this correction becomes negative also about 1893·5.

THE ANCIENT CIVILIZATION OF CENTRAL AMERICA.

In Central America there are abundant traces of the existence of a great race which must at one time have attained to a comparatively high state of culture. It was undoubtedly a race of American Indians, and as undoubtedly closely connected with the present Indian inhabitants of the country.

No trace, however, of the ancient culture and knowledge can be found amongst the Indians of to-day, and the numerous ruins which lie scattered over the country are the remains of towns which have neither names nor history attached to them.

Very little information can be gathered from the published writings of the Spaniards who overran the country at the close of the fifteenth and beginning of the sixteenth centuries; but, apart from their bearings on Spanish history and biography, these writings have received very imperfect examination and criticism.

The Spaniards have been severely censured for their remiss-

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